Quasi-Steady Hot Wire/Hot Strip Method: Uncertainty Assessment

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The recently presented quasi-steady technique to measure the thermal conductivity combines characteristic advantages of steady-state and transient techniques but avoids major drawbacks of both these classes of methods. On the basis of a simple transient hot wire or transient hot strip setup, a direct indicating thermal-conductivity-meter can be realized by adding only one temperature sensor. After a short settling time, this instrument operates at quasi-steady conditions, i.e., no guard heaters or time windows are required. Outer boundaries are free to change in time. In this study, the combined standard uncertainty of the method is assessed in full accordance with the ISO Guide to the Expression of Uncertainty in Measurement. A value of 3 % is assessed for the thermal conductivity.